INTERAVIA

World Review of Aviation and Astronautics

Contents for Year 1965

MAIN ITEMS

No. 1 **Prospects for New Short-haul Transport**
Electronics Around the Missile (II)
The Polaris Fleet Ballistic Missile
US Radar Catalogue

No. 2 **Flight Safety and Accident Prevention**
Civil and Military Safety Equipment
McDonnell Phantom 2
Supplement: The Modern Army

No. 3 **The Douglas DC-9 Short-haul Transport**
Missile Inventory of the USSR
Microminiaturisation: I-Technology

No. 4 **Reaction Rotors for Large Helicopters**
Scientific Investigation of Aircraft Accidents
Microminiaturisation: II-Review of the US Industry

No. 5 **Titan and Saturn Launch Vehicles**
All-weather Landing Systems
Aviation Fuels

No. 6 **France's Air and Space Industry**
The European Aircraft Constructors
Jet Transports on Order by the World's Airlines
Supplement: Douglas DC-9

No. 7 **Civil Helicopter Operations**
The Gemini Story—Guidance and Control in Space
Trans World Airlines

No. 8 **Sixteen Nations at Le Bourget**
Aeroflot and its Fleet

No. 9 **The British Aerospace Industry**
North American OV-10A

No. 10 **Focus on World Air Transport. Vienna Welcomes IATA**
Turbine Aircraft for Business Flying
Standarised Electronics for Executive Aircraft

No. 11 **New High Capacity Civil Transports**
The USAF Orders the Lockheed C-5A
DIAMANT: First French satellite launcher.

No. 12 **Long-Range Navigation**
Tactical Missiles for Defence against Tanks and Low-flying Aircraft
The Mirage IIIS and the Swiss Air Force
Supplement: International Defense Review

INDEX BY SUBJECTS

1. International Organisations

IATA's 7th Public Relations Conference: 4/480a
ICAO Special North Atlantic Meeting: 5/678
Report on IATA's 16th Technical Conference 6/984
The 15th ICAO General Assembly: 9/1356
The 21st Annual General Meeting of IATA in Vienna.—L. Konschegg: 10/1565
NATO Tactical Weapons Meet in France—H. Blondiau: 11/1706
IATA's 21st Annual General Meeting: 12/1945
IATA's Technical Department—The Man and the Organisation behind Air Transport: 12/1945

2. Defence and Political

NASA Future Planning: 1/31
The American-German Defence Agreement: 1/34
A Tired Alliance: 1/43
Eating the Seed Corn: 3/357
The US Defence Budget: 4/479
The Final Decision: 5/627
Disturbing Reflection: 5/627
The British Aerospace Industry: 6/917
The US Aerospace Industry—A Profile: 6/929
Increased Credits for ELDO—A European Obstacle Race: 6/890
Europe and Space: 7/1067
The Reorganisation of the French Armaments Ministry 12/1966

3. Civil Aviation

Science and Prescience at ITA Symposium: 1/14
Prospects for New Short-haul Transports: 1/44
The State of Air Union: 2/210
Continued Expansion in Soviet Air Traffic: 2/254
International Airlines' Future: A European View—S. Wheatcroft: 3/358
Helicopter Operations in the USSR: 3/364
IATA's 7th Public Relations Conference: 4/480a
Denmark's Sterling Airways: 5/634
Entertainment in the Air: 5/635
The Booming Airlines: 6/981
Helicopters in Civil Aviation: 7/1069
British United Airways Helicopter Division: 7/1074
New York Airways: 7/1076
Civil Helicopters of the World: 7/1078
Sikorsky S-61 Helicopters for Civil Operations: 7/1082
Trans World Airlines—An Airline Success Story: 7/1109
Trans World Airlines (II): 8/1288
Britain's Airlines: 9/1401
British Eagle—An Independent Enterprise: 9/1404

The British Aerospace Industry—D. Wood: 9/1373
Pillars of World Air Transport: 10/1549
Four Decades of Austrian Airline Activity: 10/1565
The 21st Annual General Meeting of IATA in Vienna—L. Konschegg: 10/1565
Is There Competition in Air Transport ? J. Brancker: 10/1567
Where the Airlines Stand : 10/1571
Soviet Civil Aviation in Agricultural Service: 10/1574
First Steps to the Airbus: 11/1688
Civil Aviation in East Germany—H. Schmidt: 11/1756
Why Not Ask the Passenger? : 12/1899
IATA's 21st Annual General Meeting: 12/1945
IATA's Technical Department—the Man and the Organisation behind Air Transport: 12/1947

4. Service Aviation

Swiss Mirage Programme Report: 3/339
The French ECAT Programme: 3/382
With the Wrong Weapons: 4/497
New Patterns in Tactical Aircraft: 9/1412
NATO Tactical Weapons Meet in France—H. Blondiau: 11/1706
Tactical Missiles for Defence against Tanks and Low-flying Aircraft—K. Fischer 12/1923

5. Aircraft

a) **Civil Aircraft**

Prospects for new Short-haul Transports: 1/44
Boeing enters the Short-haul field: 1/49
Aircraft in the News (XV-5A, XC-142A, Dart Convair, CL-41G): 1/54
DC-9 Rollout: 2/227
Continued Expansion in Soviet Air Traffic: 2/254
The DC-9-Douglas enters the Short-haul Market: 3/361
Helicopter Operations in the USSR: 3/364
The Fairchild Hiller FH-1100: 4/503
AiResearch Powerplants for the Turbo Commander: 4/504
Boeing announces the 737: 4/505
Boeing 737 Data Sheet: 5/637
" Why we chose the DC-9 ": 6/723
The DC-9: Design and Detail: 6/726
Flight Testing: 6/739
For Passenger Cargo Operations: 6/742
Concorde: 6/807
Il-18 Construction and Assembly: 6/959
Civil Helicopters of the World: 7/1078
Sikorsky S-61 Helicopters for Civil Operations: 7/1082
Across the Atlantic with the Super VC-10—D. Wood: 7/1141
New Versions of the Boeing 737: 7/1142
New Aircraft Projects at Le Bourget: 8/1219
Equipment for the Concorde: 8/1255
The Dornier Do 28D Skyservant: 8/1264
Soviet Air Transports for Export: 8/1281
The North American OV-10A: 9/1413
Modern Business Aircraft: 10/1530
The Lear Jet: 10/1534
The HFB 320 Hansa Undergoes Rigorous Testing: 10/1537
The Hawker Siddeley HS.125 in Service: 10/1540
De Havilland Canada's Twin Otter: 10/1577
First Steps to the Airbus: 11/1688
Two French Airbus Projects—Breguet 124 & Nord 600: 12/1954

b) **Military Aircraft**

Aircraft in the News . . . : 1/54
Convair Model 48 Charger: 1/103
McDonnell Phantom 2—Profile of a Two-seat Fighter: 2/259
F-111A Starts Flight Trials: 2/264
The Sikorsky CH-53A Sea Stallion: 2/266
Swiss Mirage Programme Report: 3/339
The French ECAT Programme: 3/382
A Cross-section of the World's Training and Ground Support Aircraft: 3/384
The C-5A Takes Shape: 3/424
The Hughes XV-9A Reaction Rotor: 4/501
Ryan/Republic Propose an Advanced XV-5A: 4/250
Flygmotor's RM 8 Engine for the Viggen: 4/524
Second Generation Dominie—The HS.125 Navigation Trainer: 4/526
The SA.330 Tactical Helicopter: 6/883
Saab 37 Viggen—a Multi-Purpose Combat Aircraft: 6/886
Roll-out of the Bell X-22A: 6/810
The Naval F-111 Starts Flight Tests: 7/1126
Progress on the CL-84 Dynavert: 7/1127
New Aircraft Projects at Le Bourget: 8/1219
Panoramic Cameras for the Vigilante: 9/1410
New Patterns in Tactical Aircraft: 9/1412
Final Assembly of the A-7A Corsair 2: 10/1576
Lockheed C-5A—The World's Biggest: 11/1686
The CL-84 Dynavert: 11/1710
Do. 31 Development makes Progress: 11/1751
The C-141's Automatic Navigation System: 12/1912
Light Observation Helicopters for the US Army: 12/1930
The Fiat G.91Y: 12/1934
Tripartite Evaluation of VTOL Operations: 12/1936
The Mirage IIIS and the Swiss Air Force: 12/1950
Introducing the A-7A Corsair 2: 12/1956

6. Guided missiles and rockets

Rockets, Missiles and Space Vehicles: 1/80, 2/267, 4/527, 7/1138, 9/1442
NASA Future Planning: 1/31
Electronics Around the Missile—A. R. Lombardo: 1/71
The Polaris Fleet Ballistic Missile—L. Wilson: 1/76
Testing the Rocketdyne F-1: 1/82
Soviet Missile Inventory (I): 3/377
Aerochemie Solid-fuel Rocket Engines: 3/386
New Rocket Motor Developments: 3/388
The Agena Multi-Purpose Space Vehicle: 3/390
Snapper and Swatter—Two Soviet Anti-tank Missiles for the Ground Forces: 4/529
Missiles—Not Many New Developments: 8/1223
Canadair's CL-89 Reconnaissance Drone: 11/1718
Diamant, the First French Satellite Launcher: 11/1744

7. Powerplants

The Turborocket for High Speed Air Breathing Vehicles—A. Lombard: 1/51
Testing the Rocketdyne F-1: 1/82
Aerochemie Solid-Fuel Rocket Engines: 3/386
New Rocket Motor Developments: 3/388
AiResearch Powerplants for the Turbocommander: 4/504
Flygmotor's RM 8 Engine for the Viggen: 4/524
J-79: 6/810
Aircraft Engines . . . and Rocket Motors: 8/1220
The GE 1—Variations on a Jet Engine: 8/1257
Two Turbojets in one Thrust Class—the Rolls-Royce/Turboméca
RB.172/T.260 . . . and the Bristol Siddeley/SNECMA M.45: 9/1397 & 1398
Flygmotor tests the Viggen's RM8 Engine—E. Moeller: 11/1742
Developments in Vectored Thrust Turbofan Engines—J. Barrett: 11/1748

8. Electronics

Electronics in Aviation and Industry: 1/86, 2/283, 3/414, 4/554, 6/952, 7/1131, 9/1433, 10/1597, 11/1735
US Radar Catalogue: 1/59
Electronics Around the Missile—A. Lombardo: 1/71
Automation in Supersonic Transport—B. Hunn: 1/108
Haystack—A new Microwave Research Facility: 2/286
The Photoscan Reconnaissance System: 2/288
A System Concept of Flight Recording: 2/290
A Problem Solved by Radar Absorbent Materials: 2/291
The Latest Step in Microminiaturisation: 3/409
The Computer Industry Lines up for Battle—J. Rieck: 3/416
Integrated Circuitry: II—A Review of the US Industry: 4/549
Three Proposals for ATC Expansion in Italy: 4/560
A Ten Year Plan for Western Germany's Air Traffic Control: 4/562
Litton Industries—Pacing the new Technology: 5/638
All-Weather Landing: 5/628
Early Bird Links USA and Europe: 5/659
Integrated Circuitry—Manufacturing Techniques and Applications: III—The European Scene: 6/949
Better Late than Never—NADGE, A Fresh Spurt: 6/988
NATO's New VLF Transmitter at Anthorn: 7/1128
Flight Testing a New Inertial Navigator Developed in Sweden: 7/1130
A Laser Profiler for Aerial Mapping: 7/1134
Aerospace Electronics at Paris: 8/1249
The British Electronics Industry and Aviation—G. Lander: 9/1383
Aeronautical Communications by Satellite—W. Lynch: 9/1408
Navcom Equipment for Executive and Touring Aircraft: 10/1600
Decca Navigator in Berlin Corridor Demonstrations: 10/1604
Selenia's RIS-3E Monopulse Tracking Radar: 11/1738
Gemini Rendezvous Radar: 11/1740
Long-Range Navigation: 12/1900
Navigation on North Atlantic Routes: 12/1905
Design Philosophy for a Low Cost Inertial Navigator—B. Lichtenstein: 12/1907

Dectra 2—H. Capes: 12/1909
The C-141's Automatic Navigation System: 12/1912

9. Astronautics

Rockets, Missiles and Space Vehicles: 1/80, 2/267, 4/527, 5/690, 6/986, 7/1138, 9/1442
Space Research—Space Technology: 11/1752, 12/1964
NASA Future Planning: 1/31
Testing the Rocketdyne F-1: 1/82
Mariner Probes Mars: 1/84
Reconnaissance Satellites: 1/104
New Rocket Motor Developments: 3/388
The Agena Multi-Purpose Space Vehicle: 3/390
Satellites in Orbit: 3/431
Tiros 9 and OSO 2: 3/432
The Way to the Moon: 4/558
Early Bird links USA and Europe: 5/659
Titan Rockets for Civil and Military Spacecraft: 5/686
The Saturn 1B First Stage: 5/692
Baikonur: Launch of Voskhod 2: 5/695
Cape Kennedy: Launch of Gemini GT-3: 5/696
Spacecraft Galore: 5/697
Increased Credits for ELDO—A European Obstacle Race: 6/890
Design and Construction of the Gemini Spacecraft: 6/954
The Gemini GT-4: 7/1049
Europe and Space: 7/1067
Vostok—Russia's First Manned Spacecraft: 7/1101
Gemini's Guidance and Control System: 7/1105
Space: Interesting Projects on View: 8/1222
Mariner IV Photographs Mars: 8/1189
The Gemini GT-4 Flight in Pictures: 8/1258
Solid-propellant Boosters for Titan III-C: 8/1260
Fuel Cells Today: 8/1297
Space News in Brief: 9/1355, 11/1667, 12/1872
Aeronautical Communications by Satellite: W. Lynch: 9/1408
Latest Space Developments: 10/1578
Zond 3 . . . and Voskhod 2: 10/1580
Gemini GT-5: Eight Days of Weightlessness: 10/1614
Douglas and General Electric to build the MOL: 11/1692
Gemini Rendezvous Radar: 11/1740
Diamant, the First French Satellite Launcher: 11/1744
Gemini GT-6: A Missed Opportunity: 12/1963

10. Non-Electronic Equipment

Equipment, Materials, Techniques: 3/418, 4/530, 7/1136, 9/1440, 12/1914
STAN—Automating Aircraft Weight and Balance: 1/107
Safety and Survival: 2/242
Entertainment in the Air: 5/635
Guidance and Control with Fluids: 5/676
The Significance of the Equipment Industry: 8/1224
Equipment for the Concorde: 8/1249
General Electric's Fuel Cell—A Compact Power and Water Source: 9/1297
Panoramic Cameras for the Vigilante: 9/1410

11. Airports and Airport Equipment

The Aérazur Net Arrester System: 2/248
Brake Units for Arrester Systems: 2/249
SATS—The Short Airfield for Tactical Support: 11/1703

12. Research and Technical

The Turborocket for High Speed Air Breathing Vehicles—A. Lombard: 1/51
Aircraft in the News: (XV-5A, XC-142A, Dart Convair, CL-41G): 1/54
The World's Most Powerful Helicopter Rotor: 1/110
Flight Safety and Accident Prevention: 2/239
Safety and Survival: 2/242
The Research Laboratories of the United Aircraft Corporation: 2/250
New Rocket Motor Developments: 3/388
Low Pressure Reaction Rotors for Heavy Duty Helicopters: 4/498
The Hughes XV-9A Reaction Rotor: 4/501
An Exercise in Detection—Scientific Accident Investigation: 4/517
Ryan/Republic Propose an Advanced XV-5A: 4/520
Rain Erosion on High Speed Aircraft: H. Busch, G. Hoff: 5/675
Flight Testing (DC-9 Supplement): 6/739
Roll-out of the Bell X-22A: 6/810
Progress on the CL-84 Dynavert: 7/1127
Do 31 Development makes Progress: 11/1751

13. Industry

French Industry and the Loi-Programme: 1/32
An Uncertain Future for the British Industry: 2/210
Swiss Mirage Programme Report: 3/339
The Final Decision: 5/627
Litton Industries—Pacing the New Technology: 5/638
The Saturn 1B First Stage: 5/692
The French Aeronautical Industry—J. de Galard: 6/859
The Leading Companies of the French Aviation Industry: 6/863
The French Aerospace Industry: A Survey of Present and Future Prospects—L. Bonte: 6/879
Products of the French Aerospace Equipment Industry: 6/881
The British Aerospace Industry—D. Wood: 6/917
The Italian Aerospace Industry: 6/920
A Decade of Aircraft Construction in the German Federal Republic: 6/924
The US Aerospace Industry—a Profile: 6/929
Design and Construction of the Gemini Spacecraft: 6/954
Il-18 Construction and Assembly: 6/959
The British Aerospace Industry—D. Wood: 9/1373
The Bölkow Story: 9/1435
Final Assembly of the A-7A Corsair 2: 10/1576
Not by Bread Alone: 11/1685
Flygmotor Tests the Viggen's RM8 Engine—E. Moeller: 11/1742
USIAS: 12/1881

14. Exhibitions, Congresses, Meetings

Confidence or Optimism: 6/859
First Impressions of the Paris Salon: 7/1050
An Impressive Show Full of Contrasts: 8/1207
Over 150 Aircraft on Display: 8/1215
New Aircraft Projects at Le Bourget: 8/1219
Aircraft Engines . . . . . and Rocket Motors: 8/1220
Space: Interesting Projects on View: 8/1222
Missiles: Not Many New Developments: 8/1223
The Significance of the Equipment Industry: 8/1224
Aerospace Electronics at Paris—Microminiaturisation gains Ground: 8/1251
IVA—The First International Transport Exhibition: 11/1754

15. Miscellaneous

Interavia Air Letter Reports: 1/11, 2/207, 3/321, 4/461, 5/591, 6/787, 7/1037, 8/1171, 9/1337, 10/1493, 11/1649, 12/1871
What's in the Air?: 1/98, 2/270, 3/368, 4/508, 5/662, 6/960, 7/1112, 8/1292, 9/1444, 10/1606, 11/1649, 12/1957
Viewpoint: 1/33, 2/230, 3/340, 4/480b, 5/610, 6/790, 7/1143, 8/1190, 10/1512, 11/1668, 12/1882
Book Reviews: 2/292, 3/433, 5/697, 6/990, 7/1143, 8/1300, 9/1457, 11/1757
Readers' Letters: 1/111, 2/292, 3/433, 5/698, 6/990, 8/1300, 11/1757
Hovercraft Development in Great Britain: 1/56
The Development of the SR.N5: 1/56
The Flying Doctor Services in Australia: 1/95
Soviet Hydrofoil Vessels for River and Ocean Services: 3/420
The Grumman Dolphin: 4/506
An Exercise in Detection—Scientific Accident Investigation: 4/517
Aviation Fuels—From Diatoms to the Jet Age: 5/679
North Sea Oil—J. Dean: 5/682
New Soviet Air Cushion Vehicles: 7/1125
The 10th World Gliding Championships 1965—A. Ince: 8/1284
British Hovercraft Development: 9/1379
General Aviation Gains Ground: 10/1529
General Aviation in France: 10/1542
Project GAPE: 10/1512
Fighter-Pilot Training in the Soviet Air Force: 10/1612

16. Tables

US Radar Catalogue: 1/59
Satellites in Orbit: 3/431
The Leading Companies of the French Aviation Industry: 6/863
United Kingdom Air Carriers: 9/1403
Pillars of World Air Transport: 10/1549

17. Special Supplements

The Modern Army: Weapons and Technology (2/1965)

Introduction: p. 139
The Concept Behind the Chieftain Tank—P. Hordern: p. 140
The Chieftain Tank: p. 142
New Tanks in Words and Pictures: p. 144
European Tank Development: p. 146
Countering the Tank by Guided Missile: p. 148
Air Power in the Land Battle: p. 155
France and Germany Cooperate to Develop a New Generation of Tactical Missiles: p. 159
Defence against Low Level Attack—the Infantry's Weak Spot: p. 160
Defence of Ground Forces Against Low-Flying Aircraft, F. van Pelt: 162
Telecommunications in the Jungle—I. Spear: p. 164
Weapons • Vehicles • Equipment: p. 168
Land Navigation—D. Wood: p. 171

The Douglas DC-9 (6/1965)

Introducing the DC-9 p. 723
Why we chose the DC-9 p. 723
The DC-9: Design and Detail p. 726
Flight Testing p. 739
For Passenger/Cargo Operations p. 742

International Defense Supplement (12/1965)

Notes on the Malayan Emergency—E. S. Lindsay: p. 1790
Operations in Malaya and Borneo—J. M. Strawson: p. 1791
New Fighting Vehicles of the US Army: p. 1794
The US Marine Corps Mission: p. 1798
The Swedish " S " Tank: p. 1799
Bofors 155 mm. Self-propelled Gun: p. 1802
The Abbot Self-propelled Gun: p. 1803
Green Archer—A Mobile Field Radar System for Mortar Location—D. Wood: p. 1805
Gas Turbines for Fast Marine Craft—G. G. Connor: p. 1815
USS Bainbridge: America's First Nuclear Powered Guided Missile Frigate: p. 1818
Naval Radar: p. 1820
Defending Ships against Aerial Attack—The NA9 Fire Control System—L. C. Rossi: p. 1824
Weapons, Vehicles, Equipment: p. 1826
The Rolls-Royce K60 Multi-Fuel Engine: p. 1830
How's Your Intelligence?—E. W. Kirk: p. 1831

INDEX OF AUTHORS

Barrett, J. A.—Developments in Vectored Thrust Turbofan Engines: 11/1748
Blackwell, H. R.—A System Concept of Flight Recording: 2/290
Blondiau, H.—NATO Tactical Weapons Meet in France: 11/1706
Bonte, L.— The French Aerospace Industry—A Survey of Present and Future Prospects: 6/879
Brancker, J. W. S.—Is there Competition in Air Transport? 10/1567
Busch, H. and Hoff, G.—Rain Erosion on High Speed Aircraft: 5/675

Capes, H. B.—Dectra 2: 12/1909
Connor, G. G.—Gas Turbines for Fast Marine Craft: 12/1789 (Special Supplement)

Dean, J. R.—North Sea Oil: 5/682

Fischer, K.—Tactical Missiles for Defence Against Tanks and Low-Flying Aircraft: 12/1923

Galard, J. de—The French Aeronautical Industry —Still Standing Firm: 6/859

Hoff, G. and Busch, H.—Rain Erosion on High Speed Aircraft: 5/675
Hordern, P. H.—The Concept Behind the Chieftain Tank: 2/140 (Special Supplement)
Hunn, B. A.—Automation in the Supersonic Transport: 1/108

Ince, A.—The 10th World Gliding Championships: 8/1284

Keenan, J. C. and Lombard, A. A.—The Turborocket for High Speed Air Breathing Vehicles: 1/51
King, P.—A Problem Solved by Radar Absorbant Materials: 2/291
Kirk, E. W.—How's Your Intelligence?: 12/1831 (Special Supplement)
Konschegg, L.—The 21st Annual General Meeting of IATA in Vienna: 10/1566

Lander, G.—The British Electronics Industry and Aviation: 9/1383
Lichtenstein, E. S.—Design Philosophy for a Low Cost Inertial Navigator: 12/1907
Lindsay, E. S.—Notes on the Malayan Emergency: 12/1790 (Special Supplement)
Lombard, A. A. and Keenan, J. C.—The Turborocket for High Speed Air Breathing Vehicles: 1/51
Lombardo, A. R.—Electronics Around the Missiles (II): 1/71
Lynch, W. W.—Aeronautical Communications by Satellite: 9/1408

Moeller, E.—Flygmotor Tests the Viggen's RM8 Engine: 11/1742

Nafzger, H. and Würsch, J.—Navigation on North Atlantic Routes: 12/1905

Pelt, F. van—Defence of Ground Forces Against Low-Flying Aircraft: 2/123 (Special Supplement)

Rieck, J. M.—The Computer Industry Lines up for Battle: 3/416
Rossi, L. G.—Defending Ships against Aerial Attack—The NA9 Fire Control System: 12/1824

Schmidt, H. A. F.—Civil Aviation in East Germany: 11/1756
Smith, B. M.—Solid-Propellant Boosters for Titan III-C: 8/1260
Spear, I. C.—Telecommunications in the Jungle: 2/164 (Special Supplement)
Strawson, J. M.—Operations in Malaya and Borneo: 12/1791

Wheatcroft, S.—International Airlines' Future: A European View: 3/358
Wilson, L. H.—The Polaris Fleet Ballistic Missile: 1/76
Wood, D.—The British Aerospace Industry: 6/883, Across the Atlantic with the Super VC.10: 7/1141, The British Aerospace Industry 9/1373, Green Archer—A Mobile Field Radar System for Mortar Location: 12/1789 (Special Supplement)
Würsch, J. and Nafzger, H.—Navigation on North Atlantic Routes: 12/1905

Publisher: Interavia, Geneva 11, Switzerland